

Serial No. 09/671,674

Response to Official Action of February 11, 2004

IN THE CLAIMS

Please rewrite Claims 133, 136, 154 and 157 as shown herein.

1 133. (Amended) A compound objective lens, comprising a region to produce a
2 focal point on an information plane through a layer, wherein
3 the region of the lens is divided into a plurality of regions including at least both
4 of a first region and a second region by dividing the region of the lens depending
5 on differences in a distance from an optical axis of the lens,
6 the first region being located at a position farther from the optical axis than a
7 position of the second region,
8 the second region being optimized so that the lens has a numerical aperture NA2
9 to produce a focal point through a second layer on an information plane placed at a
10 distance T2 from a surface of the second layer, and
11 both of the first region and the second region being optimized so that the lens has
12 a numerical aperture NA1 (NA1 is not equal to NA2) to produce a focal point through a
13 first layer on an information plane placed at a distance T1 (T1 is not equal to T2) from
14 the surface of the first layer,
15 wherein the compound objective lens has a first convex surface and a second
16 convex surface opposite to each other, for receiving a beam of incident light of one
17 particular wavelength passing through the optical axis at the first convex surface, and the
18 compound objective lens refracts the beam of incident light and emits a beam of refracted
19 light from the second convex surface, and
20 the region of the lens receives the beam of incident light not yet refracted by the
21 lens, and generates from the incident light a plurality of beams of divided light, and

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22 generates a plurality of focal points which are placed on the optical axis on a side facing
23 the second convex surface.

1 136 (amended). A compound objective lens according to claim 134, in which the
2 optical relief is provided on a side of the compound objective lens opposite to an optical
3 disk.

1 154. (Amended) An optical head apparatus for performing at least one of
2 recording and reproduction of pieces of information on and from an optical disk placed to
3 face the optical head apparatus, comprising
4 (i) an optical source for radiating a light beam; and
5 (ii) a compound objective lens receiving the light beam and comprising a region
6 to produce a focal point on an information plane through a layer, wherein
7 the region of the lens is divided into a plurality of regions including at least both
8 of a first region and a second region by dividing the region of the lens depending
9 on differences in a distance from an optical axis of the lens,
10 the first region being located at a position farther from the optical axis than a
11 position of the second region,
12 the second region being optimized so that the lens has a numerical aperture NA2
13 to produce a focal point through a second layer on an information plane placed at a
14 distance T2 from a surface of the second layer, and
15 both of the first region and the second region being optimized so that the lens has
16 a numerical aperture NA1 (NA1 is not equal to NA2) to produce a focal point through a

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17 first layer on an information plane placed at a distance T1 (T1 is not equal to T2) from
18 the surface of the first layer,
19 wherein the compound objective lens has a first convex surface and a second
20 convex surface opposite to each other, for receiving a beam of incident light of one
21 particular wavelength passing through the optical axis at the first convex surface, and the
22 compound objective lens refracts the beam of incident light and emits a beam of refracted
23 light from the second convex surface, and
24 the region of the lens receives the beam of incident light not yet refracted by the
25 lens, and generates from the incident light a plurality of beams of divided light, and
26 generates a plurality of focal points which are placed on the optical axis on a side facing
27 the second convex surface.

1 157. (Amended) An optical disk apparatus, comprising:
2 (1) an optical head apparatus for performing at least one of recording and
3 reproduction of pieces of information on and from an optical disk placed to face the
4 optical head apparatus, comprising:
5 (i) an optical source for radiating a light beam; and
6 (ii) a compound objective lens receiving the light beam and comprising:
7 a region to produce a focal point on an information plane through a layer, wherein
8 the region of the lens is divided into a plurality of regions including at least both
9 of a first region and a second region by dividing the region of the lens depending
10 on differences in a distance from an optical axis of the lens,
11 the first region being located at a position farther from the optical axis than a
12 position of the second region.

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13 the second region being optimized so that the lens has a numerical aperture NA2
14 to produce a focal point through a second layer on an information plane placed at a
15 distance T2 from a surface of the second layer, and
16 both of the first region and the second region being optimized so that the lens has
17 a numerical aperture NA1 (NA1 is not equal to NA2) to produce a focal point through a
18 first layer on an information plane placed at a distance T1 (T1 is not equal to T2) from
19 the surface of the first layer, and
20 wherein the compound objective lens has a first convex surface and a second
21 convex surface opposite to each other, for receiving a beam of incident light of one
22 particular wavelength passing through the optical axis at the first convex surface, and the
23 compound objective lens refracts the beam of incident light and emits a beam of refracted
24 light from the second convex surface, and
25 the region of the lens receives the beam of incident light not yet refracted by the
26 lens, and generates from the incident light a plurality of beams of divided light, and
27 generates a plurality of focal points which are placed on the optical axis on a side facing
28 the second convex surface;
29 (2) a moving apparatus for moving the optical head apparatus; and
30 (3) a rotating apparatus for rotating the optical disk.

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Status of the Claims

Having made the foregoing amendment in accordance with the provisions of 37 CFR 1.173(b)(2), in accordance with the provisions of 1.173 (c) applicants supply herewith

"the status (*i.e.*, pending or canceled), as of the date of the amendment, of all patent claims and of all added claims, and an explanation of the support in the disclosure of the patent for the changes made to the claims."

More specifically:

Patent claims 1-18 are pending;
added claims 19-85 are pending
added claims 86-87 were canceled
added claim 88 is pending
added claims 89-91 were cancelled
added claims 92-93 are pending
added claims 94-112 were canceled
added claim 113 is pending
added claim 114 was canceled
added claim 115 is pending
added claims 116-121 were canceled
added claims 122-123 are pending
added claims 124-125 were canceled
added claim 126 is pending
added claim 127 was canceled
added claim 128 is pending
added claims 129-130 were canceled
and added claims 131 – 159 are pending.

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Support for Claim Changes

In accordance with the requirement of 37 CFR 1.173(c), the following statement provides an explanation of the support in the disclosure of the patent for the changes made to the claims.

It is respectfully submitted that support for the limitations added to claims 153, 154 and 157 by the present amendment is clearly found in issued claim 11 of the patent, as annotated and discussed (e.g., beginning at page 10) in the following Remarks. The Remarks identify the changes made in the added claims amended herein, and demonstrate that such changes relate to features recited in the issued patent claims, as particularly illustrated by claim 11. Inasmuch as the claims are part of the patent disclosure, it is further submitted that the foregoing provides the explanation of support as required by 37 CFR 1.173(c) and that no further explanation for these changes is thus required.

The present change to claim 136 is provided in response to the Examiner's objection, to avoid a question of antecedence, and does not add any features to the claim. Therefore, support for the change is found in the pending Official Action.